

**ORDER**

**DRAFT  
DOE O 452.Z**

Approved: XX-XX-2010

# **CONTROL OF NUCLEAR WEAPON DATA**

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**U.S. DEPARTMENT OF ENERGY  
National Nuclear Security Administration  
Office of Nuclear Weapon Surety and Quality**

## CONTROL OF NUCLEAR WEAPON DATA

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1. PURPOSE.

This Department of Energy (DOE) Order establishes the policy, process and procedures for control of nuclear weapon data (NWD) to ensure that dissemination of the information is restricted to individuals with appropriate clearances, approved authorization and valid need-to-know in keeping with the Atomic Energy Act stipulation of ensuring common defense and security.

2. CANCELLATION.

This Order cancels DOE O 5610.2, *Control of Weapon Data*, dated 8-1-80 with Chg 1 dated 9-2-86. Cancellation of a directive does not, by itself, modify or otherwise affect any contractual or regulatory obligation to comply with the directive. Contractor Requirements Documents (CRDs) that have been incorporated into a contract remain in effect throughout the term of the contract unless and until the contract or regulatory commitment is modified to either eliminate requirements that are no longer applicable or substitute a new set of requirements.

3. APPLICABILITY.

a. Departmental Applicability.

- (1) This Order applies to Departmental elements with access to NWD (for example, documents, materials and hardware).
- (2) The Administrator of the National Nuclear Security Administration (NNSA) must assure that NNSA employees comply with their responsibilities under this directive. Nothing in this directive will be construed to interfere with the NNSA Administrator's authority under section 3212(d) of Public Law (P.L.) 106-65 to establish Administration-specific policies, unless disapproved by the Secretary.

b. DOE Contractors.

- (1) The CRD, Attachment 1, sets forth requirements of this Order that will apply to contracts that include the CRD.
- (2) The CRD must be included in site/facility management contracts involving access to NWD. DOE site office managers may tailor portions of the CRD in the contract as needed.

c. Equivalencies and Exemptions for DOE O 452.Z.

- (1) Requests for equivalencies and exemptions to this Order must be in memorandum form and sent to the NNSA Office of Nuclear Weapon Surety and Quality, Office of Stockpile Management, Defense Programs.
  - (a) The memorandum must briefly justify the reasons for the Equivalencies/Exemptions.
  - (b) The memorandum must reference the offices, or localities, and requirements for which the equivalency/exemption is sought.
- (2) Exemptions. The following Departmental elements are exempted: Office of the Chief Financial Officer, Office of Civilian Radioactive Waste Management, Office of Economic Impact and Diversity, Energy Information Administration, Office of Electricity Delivery and Energy Reliability, Office of Energy Efficiency and Renewable Energy, Office of Fossil Energy, Office of Hearings and Appeals, Office of Human Capital Management, Office of Legacy Management, Office of Management, Office of Nuclear Energy, Office of Policy and International Affairs, Office of Public Affairs, Bonneville Power Administration, Southeastern Power Administration, Southwestern Power Administration, Western Area Power Administration.
- (3) Equivalency. In accordance with the responsibilities and authorities assigned by Executive Order (E.O.) 12344, codified at Title 50 United States Code (U.S.C.) sections 2406 and 2511 and to ensure consistency through the joint Navy/DOE Naval Nuclear Propulsion Program, the Deputy Administrator for Naval Reactors (Director) will implement and oversee requirements and practices pertaining to this Directive for activities under the Director's cognizance, as deemed appropriate.

4. REQUIREMENTS. Because of the sensitivity, access to NWD must be limited to those who have a need-to-know to accomplish their jobs safely and effectively.

A violation of the provisions of this Order relating to the safeguarding or security of Restricted Data or other classified information may result in a civil penalty pursuant to subsection a. of section 234A of the Atomic Energy Act of 1954 (42 U.S.C. 2282b). The procedures for the assessment of civil penalties are set forth in Title 10, Code of Federal Regulations (CFR), Part 824, "Procedural Rules for the Assessment of Civil Penalties for Classified Information Security Violations."

The DOE and NNSA are responsible for establishing policy concerning the control and dissemination of Restricted Data (RD) and, jointly with the Department of Defense (DoD), Formerly Restricted Data (FRD) to ensure the common defense and security. This Order pertains to the access, control and dissemination of RD and FRD only in the atomic weapons program herein referred to as NWD.

- a. This Order was developed using DOE M 470.4-1, Chg 1, *Safeguards and Security Program Planning and Management*, dated 8-26-05; DOE M 470.4-4A, *Information Security Manual*, dated 1-16-09; and NNSA Policy Letter NAP 70.4, *Information Security*, dated 7-2-10, as a baseline and is tailored for the protection and security of NWD. It incorporates national-level requirements, requirements set by the Department, NNSA specific requirements and detailed requirements requested by the sites that hold and control NWD. Notify NNSA Office of Nuclear Weapon Surety and Quality of any conflicts between this Order and the DOE Manuals or the NNSA NAPs. The Office of Nuclear Weapon Surety and Quality will continue to work closely with the DOE Office of Health, Safety, and Security (DOE/HSS) and the NNSA Office of Defense Nuclear Security in the establishment of policies and procedures that protect and control NWD.
- b. DOE and NNSA established NWD categories to provide additional need-to-know protection of specific types of NWD. The specific changes to NWD categories required by this Order are:
  - (1) Disestablishment of obsolete NWD categories formerly known as Sigmas 1-5 and Sigmas 9-13.
    - (a) Appendix A, *Control Process for Nuclear Weapon Data*, provides details for the protection of Non-Sigma NWD.
    - (b) Appendix C, *Obsolete NWD Categories*, provides historical information on the NWD Sigma categories disestablished by this Order.
  - (2) Sustainment of Sigma 14 and Sigma 15, *Protection of Use Control Vulnerabilities and Designs* and Sigma 20, *Improvised Nuclear Device Information*.
    - (a) Specific details on the management of Sigma 14 and Sigma 15 NWD are found in DOE O 452.7, *Protection of Use Control Vulnerabilities and Designs*, dated 5-14-10.
    - (b) Specific details on the management of Sigma 20 NWD are found in DOE O 457.1, *Nuclear Counterterrorism*, dated 2-7-06, and DOE M 457.1-1, *Control of Improvised Nuclear Device Information*, dated 8-10-06.
  - (3) Establishment of a new NWD category known as Sigma 18, *Protection of Complete Designs*, that provides protection of past and present U.S. nuclear weapons, nuclear devices and weapon designs. Appendix B, *Protection of Complete Designs*, provides details for the protection of Sigma 18 NWD.

- c. All newly created NWD or existing NWD that has been modified, updated or corrected must be reviewed and appropriately marked.
- d. Unmodified legacy NWD created under previous DOE Directives do not require review or remarking when accessed. NWD must be reviewed and brought up to current marking standards whenever it is released outside of the DOE/NNSA Q-cleared population within the Nuclear Security Enterprise (NSE), outside of the NSE, to DoD or Other Government Agencies (OGAs). If the NWD is determined to contain Sigma 14, Sigma 15, Sigma 18 and/or Sigma 20, it must be appropriately remarked with applicable Sigma markings prior to transmission outside of the DOE/NNSA Q-cleared population within the NSE, outside of the NSE, to DoD or OGAs.
- e. Government and non-Government personnel of other nations may be granted access to United States Government NWD as authorized under Agreements for Cooperation and by Statutory Determinations.
- f. All documents containing NWD that originated in the DOE or NNSA and were transmitted to the DoD, must also be marked Critical Nuclear Weapon Design Information (CNWDI), if appropriate, using criteria established by DoD Directive 5210.2, *Access to and Dissemination of Restricted Data*, dated 1-12-78 with Change 3 dated 11/16/94, or successor directive and joint DOE/DoD classification guides.
- g. Only individuals who have appropriate clearance and valid need-to-know are permitted access to NWD.
  - (1) Authorization for personnel to access any NWD category will be granted only to individuals, not to organizations, functional groups, or position assignments (for example, access is not granted to all members of “XYZ Division” or to all “engineers”).
  - (2) Authorization for Q-cleared personnel within the Nuclear Security Enterprise (NSE) to access Sigma 18 NWD is presumed with their association to the NSE and a need-to-know. Within the NSE, Sigma 18 is not a managed program. NNSA HQ manages access to Sigma 18 for Non-NSE, DoD and OGA personnel.
  - (3) Authorization for non-NSE personnel to access Sigma 18 NWD will be granted in accordance with requirements of this Order and documented in the Weapons Data Access Control System (WDACS) within 5 working days after authorization is granted. Visits outside the NSE will not be documented in WDACS.
  - (4) NSE personnel visits to organizations outside the NSE will not be documented in WDACS. Visits by NSE personnel to sites within the NSE will not be documented in WDACS.

- (5) Authorization for non-DOE personnel to access NWD category information will be granted in accordance with the requirements of this Order.

5. RESPONSIBILITIES.

a. Administrator, NNSA.

- (1) Administers all policies and procedures concerning the protection and control of that portion of Restricted Data or Formerly Restricted Data known as NWD, in accordance with the overall requirements in the Atomic Energy Act of 1954, as amended, Sections 141 and 144.
- (2) Administers the exchange of NWD with other nations as permitted under agreements for cooperation and as authorized by statutory determinations per the Atomic Energy Act of 1954, as amended, Sections 141 and 144.
- (3) May verbally grant access to Sigma 18 NWD, as needed, ensuring that the NNSA NWD Program Coordinator completes follow-up actions. For details on granting verbal access to Sigma 14 and Sigma 15, refer to DOE O 452.7.

b. Deputy Administrator for Defense Programs, NNSA.

- (1) Protects and controls access to that portion of Restricted Data or Formerly Restricted Data known as NWD, and ensures that the information is protected and access is controlled in accordance with the overall requirements in the Atomic Energy Act of 1954, as amended, Sections 141 and 144.
- (2) May verbally grant access to Sigma 18 NWD, as needed, ensuring that the NNSA NWD Program Coordinator completes follow-up actions. For details on granting verbal access to Sigma 14 and Sigma 15, refer to DOE O 452.7.
- (3) Ensures that all policy and procedures concerning the exchange of NWD with other nations, as permitted under agreements for cooperation and as authorized by Statutory Determinations per the Atomic Energy Act of 1954, as amended, Sections 141 and 144, are strictly adhered to.

c. Associate Administrator for Defense Nuclear Security.

- (1) Oversees policies regarding security and protection of Restricted Data and Formerly Restricted Data information and matter across NNSA.
- (2) Ensures that the conduct of classification controls across the enterprise is in accordance with this Order and other established policies.

- (3) Manages the Classified and Controlled Information program for NNSA, ensuring that classified and sensitive unclassified information is properly protected, proper classification guidance is available, distributed and properly coordinated across the NNSA.
  - (4) Manages the Incidents of Security Concern program ensuring that NNSA organizations properly report and investigate incidents of security concern involving Restricted Data and Formerly Restricted Data.
  - (5) Manages the Classified Matter Protection and Control Program for NNSA HQ.
  - (6) Develops and conducts programs to train NNSA HQ employees on their NWD responsibilities.
- d. Assistant Deputy Administrator for Stockpile Management.
- (1) Serves as senior technical advisor on NWD policy for the Administrator, NNSA.
  - (2) May verbally grant access to Sigma 18 NWD, as needed, ensuring that the NNSA NWD Program Coordinator completes follow-up actions. For details on granting verbal access to Sigma 14 and Sigma 15, refer to DOE O 452.7.
  - (3) Approves or denies requests from foreign nationals for access to NWD, in accordance with mutual defense agreements (Atomic Energy Act of 1954, as amended, Sections 141 and 144).
  - (4) Serves as the final adjudication authority for all Sigma NWD not related to Sigma 20.
  - (5) Oversees management of the DOE/NNSA NWD program as delegated by the Deputy Administrator for Defense Programs.
  - (6) Appoints the DOE/NNSA NWD Program Coordinator and Alternate Program Coordinator.
  - (7) Approves DOE/NNSA HQ requests for NWD from the Defense Technical Information Center (DTIC).
  - (8) Approves requests for DOE documents containing NWD (except classification guides, which are distributed via DOE Office of Classification) from OGAs including DTIC.
  - (9) Oversees the NNSA HQ Statement of Security Assurance (SSA) mail channel program as delegated by the Deputy Administrator for Defense Programs.

- e. Director, Office of Nuclear Counterterrorism. Serves as the final adjudication authority for all Sigma 20 NWD.
- f. Director, Office of Nuclear Weapon Surety and Quality.
  - (1) Supervises management of the DOE/NNSA NWD program as delegated by the Assistant Deputy Administrator for Stockpile Management.
  - (2) May verbally grant access to Sigma 18 NWD, as needed, ensuring that the NNSA NWD Program Coordinator completes follow-up actions. For details on granting verbal access to Sigma 14 and Sigma 15, refer to DOE O 452.7.
- g. DOE/NNSA NWD Program Coordinator.
  - (1) Manages the NNSA NWD program as delegated by the Assistant Deputy Administrator for Stockpile Management.
  - (2) May verbally grant access to Sigma 18 NWD, as needed, ensuring that the required follow-up actions are completed. For details on granting verbal access to Sigma 14 and Sigma 15, refer to DOE O 452.7.
  - (3) Ensures consistent, supporting security policies and procedures for authorizing access to NWD for:
    - (a) DOE employees and contractors outside the NSE,
    - (b) employees and contractors of DoD and OGAs,
    - (c) members of Congress and their staffs,
    - (d) members of the Federal Courts and their staffs,
    - (e) members of state governments and their employees,
    - (f) local and tribal governments, and
    - (g) foreign nationals.
  - (4) Coordinates with the DOE and NNSA Offices of Congressional and Intergovernmental Affairs and DOE Office of Health, Safety and Security for access to NWD by members of Congress and congressional staff.
  - (5) Coordinates with the DOE and NNSA Offices of Congressional and Intergovernmental Affairs to ensure that any required approvals are in place before NWD is transferred to Congress.



- (6) Enters in WDACS authorization to access Sigma 14, Sigma 15 and Sigma 20 NWD for representatives of OGAs and their contractors, members of Congress and their staffs, and other non-DOE requesters not otherwise addressed in this Order. Only visits to NSE sites will be entered in WDACS. Visits by NSE personnel to sites within the NSE will not be documented in WDACS.
- (7) Grants and enters in WDACS, authorization to access Sigma 18 NWD for representatives of OGAs and their contractors, members of Congress and their staffs, and other non-DOE requesters not otherwise addressed in this Order. Only visits to NSE sites will be documented in WDACS. Visits by NSE personnel to sites within the NSE will not be documented in WDACS.
- (8) Manages the NNSA HQ SSA program for Sigma NWD.
  - (a) Coordinates SSAs with the appropriate coordinators at DOE/NNSA HQ, all NSE and non-NSE facilities to ensure NWD activities are properly protected.
  - (b) Ensures that all facilities that submit a SSA have the appropriate facility clearance, storage capability, valid justification and need-to-know before authorizing the facility to receive and store NWD.
  - (c) Coordinates, approves, and disapproves SSAs submitted by DOE/NNSA HQ, non-NSE and NSE facilities for NWD for OGAs and OGA contractors that request authorization to receive and store NWD.
- h. Director, Office of Security Assistance. Maintains the Safeguards and Security Information Management System (SSIMS), which designates the facilities and agencies authorized to receive, store, and conduct NWD work.
- i. Director, Office of Classification. Manages the Government-wide program to classify and declassify nuclear weapon-related technologies.
- j. Director, Office of Scientific and Technical Information (OSTI), Oak Ridge.
  - (1) Collects and maintains a repository for scientific and technical NWD information originated by DOE/NNSA offices and their contractors and by DoD offices and their contractors (if the DoD information is pertinent to DOE/NNSA national defense missions). (Reference DOE O 241.1A or its successors and DTIC exchange agreements)
  - (2) Provides abstracting and indexing services for scientific and technical NWD reports.

- (3) Maintains computerized NWD databases, which are available to authorized users through approved and accredited remote telecommunications links. [e.g., Enterprise Secure Network (ESN)].
- (4) Implements the DOE/DoD technical information exchange agreement under the auspices of the Joint Coordinating Committee.
- (5) Coordinates NWD from DTIC for authorized DOE personnel.
- (6) With approval from the Assistant Deputy Administrator for Stockpile Management, or authorized designees, grants access to NWD and transmits NWD documents from OSTI's custody to Departmental offices and their contractors and to organizations outside the Department of Energy in accordance with requirements of this Order.
- (7) Assist NNSA Headquarters, Site Offices, and National Laboratories in implementing their policies and procedures for the management of Department-sponsored scientific and technical information containing NWD.

NOTE: Policy for the OSTI/DTIC database management agreement falls under the auspices of the Joint Coordinating Committee.

k. Directors of Headquarters Offices.

- (1) Confirm that HQ personnel under their cognizance who have been granted access to NWD including Sigma 14, Sigma 15, Sigma 18 (for non-NSE employees and contractors) and/or Sigma 20 have:
  - (a) appropriate clearance and
  - (b) valid need-to-know for each NWD category they have been granted access.
- (2) Ensure that DOE employees and contractors under their jurisdiction follow the requirements of this Order and the CRD.
- (3) Ensure that NWD in their custody is transmitted to other DOE or NNSA entities only after it is verified that the recipient has:
  - (a) appropriate security clearance,
  - (b) valid need-to-know,
  - (c) access authorization for the appropriate NWD category, and
  - (d) appropriate site clearance, storage capability and authorization recorded in the SSIMS.

- (4) Assure that Sigma NWD to be transmitted to DoD or OGAs is reviewed for classification content and prescribed markings, and determine that recipients are authorized to have access by contacting the Office of Nuclear Weapon Surety and Quality.
- (5) Assure the disposition of NWD upon completion of work requiring access or termination of a contract.

1. Heads of Site/Field Elements.

- (1) Ensure that NWD is disseminated only to personnel under their cognizance with appropriate clearance, Sigma access authorization, and valid need-to-know.
- (2) Ensure that site office/field element personnel including support contractors who are authorized access to NWD have sufficient training, awareness, and knowledge of procedures for protecting NWD.
- (3) Ensure that DOE personnel including support contractors follow the requirements of this Order and the CRD.
- (4) Coordinate with OSTI to provide appropriate life-cycle management of scientific and technical NWD produced under their jurisdiction in accordance with the requirements found in DOE O 241.1A.
- (5) Assure the disposition of NWD upon completion of work requiring access or termination of a contract.
- (6) Approve and transmit to the Manager, Office of Scientific and Technical Information (OSTI), any requests for weapon data reports from Defense Technical Information Center (DTIC).

6. DEFINITIONS.

- a. Control Stations. Control stations maintain records, accountability systems, access lists (when required), and control classified matter (including facsimiles) received by and/or dispatched from facilities. Control station operators must maintain accountability systems for accountable matter described in DOE M 470.4-4A, *Information Security Manual* or NNSA Policy Letter (NAP) 70.4, *Information Security* (or successor directives).
- b. Critical Nuclear Weapon Design Information (CNWDI). A DoD category of weapon data designating that Top Secret/Restricted Data or Secret/Restricted Data revealing the theory of operation or design of the components of a thermonuclear or implosion-type fission bomb, warhead, demolition munitions, or test device. Specifically excluded from designation as CNWDI is information concerning:

- (1) arming, fuzing, and firing systems;
  - (2) limited life components;
  - (3) total contained quantities of fissionable, fusionable, and high explosive materials by type; and
  - (4) components which military personnel set, maintain, operate, test, or replace.
- c. **Complete Design**. In the context of this Order, complete design is the compilation of design information revealing materials, masses, dimensions, contours and specifications in sufficient detail to enable a nuclear weapon to be copied or constructed and includes:
- (1) classified graphical depictions with accompanying technical details regarding dimensions, materials and mass data that would enable reconstruction of the engineering drawings and
  - (2) design drawings for Nuclear Explosive Like Assemblies (NELAs) that identify the specific material difference for the corresponding design.
- Note 1:** Complete design applies equally to a single stage device and the individual devices (primary or secondary) of a thermonuclear device.
- Note 2:** Visual access alone to classified displays, 3-D trainers, weapon components or NELAs neither constitutes nor requires access to Sigma 18.
- Note 3:** The controls for Sigma 18 access do not replace the requirements for need-to-know assessments regarding individual Restricted Data documents that would not meet the criteria for Sigma 18 controls, yet would, if formally added together, comprise Sigma 18.
- d. **Defense Technical Information Center (DTIC)**. The central facility, sponsored by the DoD, for secondary distribution of technical reports generated by research, development, test, and evaluation efforts.
- e. **Documents**. Written, printed information; removable automated data processing media (diskettes, tapes, cards, etc.); charts; maps; paintings; drawings; engravings; sketches; photographic prints; exposed or developed film; working notes and papers; reproductions by any means or process; and sound and video recordings by magnetic, optical, or any other electronic means (i.e., documents in electronic format).
- f. **Formerly Restricted Data (FRD)**. Classified information jointly determined by the DOE or its predecessor agencies and the DoD to be (1) related primarily to the military utilization of atomic weapons and (2) protected as National Security

Information. It is subject to the restrictions on transmission to other countries and regional defense organizations that apply to Restricted Data.

- g. Material. Any substance regardless of its physical or chemical form. This includes raw, in-process, or manufactured commodity, equipment, component, accessory, part, assembly, or product of any kind.
- h. Matter. Any combination of documents or material, regardless of physical form or characteristics.
- i. Non-Sigma NWD. The body of NWD that does not require the additional protection and control of a Sigma category beyond what is required by classification and RD/FRD protections.
- j. Nuclear Security Enterprise (NSE). The NNSA organizations that manage NWD and/or design, manufacture, or test nuclear weapons or nuclear weapon components. Included in the NSE are:
  - (1) NNSA Headquarters, Site Offices and Service Center,
  - (2) DOE Headquarters (for the purpose of this directive),
  - (3) Lawrence Livermore National Laboratory,
  - (4) Los Alamos National Laboratory,
  - (5) Sandia National Laboratories,
  - (6) Pantex Plant,
  - (7) Kansas City Plant,
  - (8) Y-12 National Security Complex,
  - (9) NNSA operations at the Savannah River Site,
  - (10) Nevada National Security Site, and
  - (11) OSTI (for the purpose of this directive).
- k. Nuclear Weapon. (From the Atomic Energy Act of 1954, as amended) Any device utilizing atomic energy, exclusive of the means for transporting or propelling the device (where such means is a separable and divisible part of the device), the principal purpose of which is for use as, or for development of, a weapon, weapon prototype, or a weapon test device.
- l. Nuclear Weapon Data (NWD). Restricted Data or Formerly Restricted Data concerning the design, manufacture, or utilization (including theory, development,

storage, characteristics, performance and effects) of nuclear explosives, nuclear weapons or nuclear weapon components, including information incorporated in or related to nuclear explosive devices. NWD is matter in any combination of documents or material, regardless of physical form or characteristics.

- m. NWD Categories. Subsets of Secret and Top Secret NWD relating to Restricted Data and/or Formerly Restricted Data concerning nuclear weapons, nuclear components, or nuclear explosive devices or materials. This information has been determined to require additional protection. The categories of NWD are:
- (1) Sigma 14
  - (2) Sigma 15
  - (3) Sigma 18
  - (4) Sigma 20

**Note 1:** Not all NWD requires the additional protection of a Sigma category. NWD that is not in a Sigma category is referred to as Non-Sigma NWD. See Appendix A for details.

**Note 2:** Secret or Top Secret Restricted Data or Formerly Restricted Data in one of the Sigma Categories that is reviewed, downgraded or redacted to Confidential may retain the Restricted Data or Formerly Restricted Data designation but loses the Sigma Category designation.

- n. Nuclear Weapon Display Area (WDA). Established secure areas where mock-ups, cut-a-ways, diagrams, and pictures of nuclear weapons are stored to provide tours, information and training to appropriately cleared personnel that have a valid need-to-know. WDA access is granted using procedures established at each location and is controlled in a manner consistent with the classification and NWD category contained in the area and the information revealed.
- o. Other Government Agency (OGA). In the context of this Order, an OGA is a permanent or semi-permanent Federal organization (including support contractors) established by the executive or legislative branches of the government responsible for oversight and administrative of a specific government function. In special situations, OGA can also include governor and legislative offices from state governments, local governments and tribal governments. Examples of OGAs include the Department of Homeland Security, the Central Intelligence Agency, the Federal Bureau of Investigation, State Governor Office and appropriately cleared OGA support contractors.
- p. Restricted Data (RD). All data concerning design, manufacture, or utilization of atomic weapons; production of special nuclear material; or use of special nuclear material in the production of energy, but excluding data declassified or removed

from the Restricted Data category pursuant to 42 U.S.C. 2162 [Section 142, as amended, of the Atomic Energy Act of 1954].

- q. Sigma 1. Obsolete. See Appendix C.
- r. Sigma 2. Obsolete. See Appendix C.
- s. Sigma 3. Obsolete. See Appendix C.
- t. Sigma 4. Obsolete. See Appendix C.
- u. Sigma 5. Obsolete. See Appendix C.
- v. Sigma 6, 7, 8. Not used.
- w. Sigma 9. Obsolete. See Appendix C.
- x. Sigma 10. Obsolete. See Appendix C.
- y. Sigma 11. Obsolete. See Appendix C.
- z. Sigma 12. Obsolete. See Appendix C.
- aa. Sigma 13. Obsolete. See Appendix C.
- bb. Sigma 14. That category of sensitive information (including bypass scenarios) concerning the vulnerability of nuclear weapons to a deliberate unauthorized nuclear detonation or to the denial of authorized use.
- cc. Sigma 15. That category of sensitive information concerning the design and function of nuclear weapon use control systems, features, and components. This includes use control for passive and active systems. It may include security verification features or weapon design features not specifically part of a use control system. (Note: Not all use control design information is Sigma 15).
- dd. Sigma 16 and 17. Not used.
- ee. Sigma 18. A category of NWD that includes information that would allow or significantly facilitate a proliferant nation or state to fabricate a credible nuclear weapon or nuclear explosive based on a proven, certified, or endorsed U.S. nuclear weapon or device. This information would enable the establishment or improvement of nuclear capability without nuclear testing or with minimal research and development. The NNSA or successor organization determines which information is placed in the Sigma 18 category. The following is a list of Sigma 18 items.
  - (1) Complete design of a gun-assembled weapon.

- (2) Complete design of a primary or single stage implosion-assembled weapon.
  - (3) Complete design of an interstage or secondary.
  - (4) Weapon design codes with one-dimensional (1D) hydrodynamics and radiation transport with fission and/or thermonuclear burn.
  - (5) Weapon design codes with two-dimensional (2D) and three-dimensional (3D) capabilities.
- ff. Sigma 19. Not used.
- gg. Sigma 20. A specific category of nuclear weapon data that pertains to “crude, simple or innovative” improvised nuclear device designs, concepts, and related manufacturing or processing pathways. Not all INDs are Sigma 20.
- hh. Use Control. The application of systems, devices, or procedures that allow timely authorized use of a nuclear explosive while precluding or delaying unauthorized nuclear detonation.

7. ACRONYMS.

**TABLE 1: List of Acronyms Used in this Order**

C	Confidential
CFR	Code of Federal Regulations
CNWDI	Critical Nuclear Weapon Design Information
CRD	Contractor Requirements Document
DoD	Department of Defense
DOE	Department of Energy
DTIC	Defense Technical Information Center
DUA	Deliberate Unauthorized Acts
DUU	Deliberate Unauthorized Use
EO	Executive Order
ESN	Enterprise Secure Network
FRD	Formerly Restricted Data
HQ	Headquarters
HSS	DOE Office of Health, Safety and Security
IND	Improvised Nuclear Device
NAP	NNSA Policy Letter
NASA	National Aeronautics and Space Administration
NISP	National Industrial Security Program
NNSA	National Nuclear Security Administration
NRC	Nuclear Regulatory Commission
NSE	Nuclear Security Enterprise
NSI	National Security Information



NWD	Nuclear Weapon Data
OGA	Other Government Agency
OSTI	Office of Scientific and Technical Information
OUO	Official Use Only
P.L.	Public Law
RD	Restricted Data
S	Secret
SIPRNET	Secret Internet Protocol Router Network
SNM	Special Nuclear Material
SSA	Statement of Security Assurance
SSIMS	Safeguards and Security Information Management System
TS	Top Secret
U.S.C.	United States Code
UC	Use Control
WDA	Weapon Display Area
WDACS	Weapons Data Access Control System

## 8. REFERENCES.

- a. 10 CFR, Part 712, *Human Reliability Program*, defines a security and safety reliability program designed to ensure that individuals who occupy positions affording access to certain materials, nuclear explosive devices, facilities, and programs meet the highest standards of reliability and physical and mental suitability.
- b. P.L. 83-703, Atomic Energy Act of 1954, as amended (42 U.S.C.).
- c. National Security Presidential Directive 28, dated 6-20-03.
- d. E.O. 13526, *Classified National Security Information*, dated 12-29-09, prescribes a uniform system for classifying, safeguarding, and declassifying national security information, including information relating to defense against transnational terrorism.
- e. DOE O 142.1, *Classified Visits Involving Foreign Nationals*, dated 1-13-04, which protects classified information by ensuring that all foreign nationals' access to classified information while visiting DOE and NNSA sites/facilities is conducted in accordance with an approved international agreement or treaty.
- f. DOE O 241.1A, *Scientific and Technical Information Management*, dated 4-9-01, with Change 1 dated 10-14-03, which establishes requirements and responsibilities for managing DOE scientific and technical information.

- g. DOE O 452.1D, *Nuclear Explosive and Weapon Surety Program*, dated 4-14-09, which establishes DOE objectives, standards, criteria, authorities, and responsibilities for the Nuclear Explosive and Weapon Surety Program.
- h. DOE O 452.4B, *Security and Control of Nuclear Explosives and Nuclear Weapons*, dated 1-22-10, which establishes requirements to implement the nuclear explosive security and use control (UC) elements of DOE O 452.1D, to ensure authorized use, when directed by proper authority, and protect against deliberate unauthorized acts (DUAs)/deliberate unauthorized use (DUU).
- i. DOE O 452.7, *Protection of Use Control Vulnerabilities and Designs*, dated 05-14-10, which establishes the policy, process and procedures for control of sensitive use control information in nuclear weapon data (NWD) categories Sigma 14 and Sigma 15 to ensure that dissemination of the information is restricted to individuals with valid need-to-know.
- j. DOE O 457.1, *Nuclear Counterterrorism*, dated 2-7-06, establishes DOE responsibilities for identifying, protecting and disseminating sensitive improvised nuclear device information.
- k. DOE M 457.1-1, *Control of Improvised Nuclear Device Information*, dated 8-10-06, establishes direction for controlling and providing access to improvised nuclear device information.
- l. DOE O 470.3B, *Graded Security Protection Policy*, dated 8-12-08, classified.
- m. DOE M 470.4-1, Chg 1, *Safeguards and Security Program Planning and Management*, dated 8-26-05, which establishes a standardized approach for protection program planning that will provide an information baseline for use in integrating Departmental safeguards and security (S&S) considerations, facilitating management evaluation of program elements, determining resources for needed improvements, and establishing cost-benefit bases for analyses and comparisons.
- n. DOE M 470.4-4A, *Information Security Manual*, dated 1-16-09, which establishes security requirements for the protection and control of matter required to be classified or controlled by statutes, regulations, or U.S. Department of Energy (DOE) Directives.
- o. DOE M 470.4-5, *Personnel Security*, dated 8-26-05, which establishes the overall objectives and requirements for the Personnel Security Program in the U.S. Department of Energy (DOE), including the National Nuclear Security Administration (NNSA).
- p. DOE O 471.3, *Identifying and Protecting Official Use Only Information*, dated 4-9-03, which establishes a program to identify certain unclassified controlled

- information as Official Use Only (OUO) and to identify, mark and protect documents containing such information.
- q. DOE M 471.3-1, *Manual for Identifying and Protecting Official Use Only Information*, dated 4-9-03, which provides direction for identifying, marking and protecting OUO information.
  - r. DOE M 475.1-1B, *Manual for Identifying Classified Information*, dated 8-28-07, which provides detailed requirements to supplement DOE O 475.2.
  - s. DOE O 475.2, *Identifying Classified Information*, dated 8-28-07, which establishes the program to identify information classified under the Atomic Energy Act or Executive Orders, so that it can be protected against unauthorized dissemination.
  - t. DoD 5220.22-M, *National Industrial Security Program*, dated 2-28-06, which provides baseline standards for the protection of classified information released or disclosed to industry in connection with classified contracts under the National Industrial Security Program (NISP).
  - u. NNSA Policy Letter NAP 70.2, *Physical Protection*, dated 7-2-10, which implements the NNSA security requirements and restrictions of the DOE for the physical protection of interests ranging from facilities, buildings, Government property, and employees to national security interests such as classified information, special nuclear material (SNM), and nuclear weapons.
  - v. NNSA Policy Letter NAP 70.4, *Information Security*, dated 7-2-10, which prescribes the security requirements and restrictions of the DOE NNSA for the protection and control of matter required to be classified by Federal statutes and regulations.
9. CONTACTS. For additional information or technical interpretation of this Order, contact the Office of Nuclear Weapon Surety and Quality at 202-586-0377.

BY ORDER OF THE SECRETARY OF ENERGY:

DANIEL B. PONEMAN  
Deputy Secretary

**APPENDIX A**  
**CONTROL PROCESS FOR NUCLEAR WEAPON DATA**

1. IDENTIFICATION OF NUCLEAR WEAPON DATA (NWD).

- a. Restricted Data or Formerly Restricted Data concerning the design, manufacture, or utilization (including theory, development, storage, characteristics, performance and effects) of nuclear explosives, nuclear weapons or nuclear weapon components, including information incorporated in or related to nuclear explosive devices. NWD is matter in any combination of documents or material, regardless of physical form or characteristics.
- b. NWD may be categorized as Sigma 14, Sigma 15, Sigma 18, Sigma 20 or Non-Sigma.
  - (1) Specific details on the management of Sigma 14 and Sigma 15 NWD are found in DOE O 452.7, *Protection of Use Control Vulnerabilities and Designs*, dated 5-14-10.
  - (2) Specific details on the management of Sigma 18 NWD are found in Appendix B, *Protection of Complete Designs*.
  - (3) Specific details on the management of Sigma 20 NWD are found in DOE O 457.1, *Nuclear Counterterrorism*, dated 2-7-06, and DOE M 457.1-1, *Control of Improvised Nuclear Device Information*, dated 8-10-06.
- c. Not all NWD requires the additional protection of a Sigma category. NWD that is not in a Sigma category is referred to as Non-Sigma NWD. Specific details on the management of Non-Sigma NWD is found in this Appendix.
- d. Newly created NWD or existing NWD that has been modified, updated or corrected must be reviewed. If the NWD is determined to contain Sigma 14, Sigma 15, Sigma 18 or Sigma 20, it must be appropriately marked.
- e. Unmodified legacy NWD with obsolete Sigma markings do not require review or remarking when accessed.

2. ACCESS REQUIREMENTS.

- a. See Table A-1 below for clearance and access requirements. In addition to the clearance requirements, access to NWD must be restricted to personnel with valid need-to know and confirmed Sigma access authorization as appropriate.
- b. The NNSA NWD Program Coordinator will provide guidance on the appropriate background investigation required for each clearance.

**TABLE A-1. Access Requirements**

	<b>DOE L Clearance</b>	<b>DOE Q Clearance</b>	<b>DoD/OGA Final Top Secret</b>	<b>DoD Final Secret &amp; CNWDI Brief</b>	<b>DoD/OGA Final Secret</b>
Non-Sigma (S-FRD;C-RD/FRD)	Yes	Yes	Yes	Yes	Yes
Non-Sigma (S-RD)	No	Yes	Yes	Yes	No
CNWDI (S-RD)	No	Yes	Yes	Yes	No
Non-Sigma (TS-RD/FRD)	No	Yes	Yes	No	No
Sigma 14 (TS-RD/FRD; S-RD/FRD)	No	Yes*	Yes*	No	No
Sigma 15 (TS-RD/FRD; S-RD/FRD)	No	Yes*	Yes*	No	No
Sigma 18 (TS-RD/FRD; S-RD/FRD)	No	Yes	Yes*	No	No
Sigma 20 (TS-RD;S-RD)	No	Yes*	Yes*	No	No

Table Key:

Yes: An individual with one of the clearances in the top row may have access to the category of classified information listed in the left column.

Yes\*: An individual with one of the clearances in the top row may have access to the category of classified information listed in the left column with the additional requirement of formal access approval.

No: An individual with one of the clearances in the top row may not have access to the category of classified information listed in the left column.

3. ACCESS REQUESTS.

- a. Requests for access to NWD category information by non-NSE personnel must be made using DOE F 5631.20, *U.S. Department of Energy Request for Visit or Access Approval*.
- b. The visit request must be submitted at least 15 working days before the date of a one-time visit or the first day of a recurring visit. Exceptions to the 15 working

day requirement can be found in DOE M 470.4-1, Chg 1, *Safeguards and Security Program Planning and Management*, dated 8-26-05.

- (1) The National Aeronautics and Space Administration (NASA) may submit Sigma 18 requests on NASA Form 405, *Request for Access Approval*.
- (2) The Nuclear Regulatory Commission (NRC) may submit Sigma 18 requests on NRC Form 277, *Request for Access*.

4. ORAL/VISUAL COMMUNICATION.

- a. Oral/visual communication (for example, discussions or presentations) must be restricted to those persons with appropriate NWD clearance, and valid need-to-know.
- b. Sites having classified nuclear weapon display areas (WDAs) will grant and control access to the WDA using procedures established at each location and controlled in a manner consistent with the classification and NWD category of the information revealed. Access to WDAs will not be entered or tracked in the Weapon Data Access Control System (WDACS).

5. RECEIVING AND TRANSMITTING.

- a. Distribution of NWD within DOE (including NNSA and other locations) will be restricted to individuals with appropriate clearance and valid need-to-know.
- b. Prior to distribution within the NSE unmodified legacy NWD requires a review for Sigma 14, Sigma 15, Sigma 18 and Sigma 20 and brought up to current marking standards.
- c. Prior to distribution outside the NSE "Q" cleared population, to DoD or OGAs, NWD must be reviewed for Sigma content and brought up to current marking standards.
- d. Before transmitting Sigma information to the DoD or OGAs, the recipient's access must be validated by the Office of Nuclear Weapon Surety and Quality.

**Note:** Sigma 14 and Sigma 20 NWD have additional requirements prior to transmission.

- e. Matter (for example, documents, hardware or electronic media).
  - (1) There are no additional requirements for handling and transmission of Non-Sigma NWD beyond the procedures outlined in DOE M 470.4-4A, *Information Security Manual*, dated 1-16-09 or NNSA Policy Letter (NAP) 70.4 *Information Security*, dated 7-2-10 (or successor directives).

- (2) Statement of Security Assurance (SSA) (formerly known as mail channel) must be established for receipt and storage of NWD for all DoD, OGAs and OGA contractor facilities. It is the sender's responsibility to contact their Safeguards and Security Information Management System (SSIMS) Coordinator to ensure that one is initiated or already in place prior to sending the material. The SSIMS Coordinator will confirm the site is authorized to receive NWD through SSIMS. If a SSA is not in place, one must be initiated and processed using the procedures outlined in DOE M 470.4-1, Chg. 1.
  - (a) A detailed unclassified justification must be provided justifying the facility's need to receive and store nuclear weapon data for those SSAs not based on a contract.
  - (b) Each SSA must be submitted to the Office of Nuclear Weapon Surety and Quality 30-days prior to the required establishment date.
  - (c) Each SSA must be properly certified.
    - 1 DoD SSAs must be properly certified by an authorized official from the most recent Enclosure 5 of the DoD Directive 5210.2. A copy can be obtained directly from the Office of the Deputy Assistant to the Secretary of Defense (Nuclear Matters).
    - 2 SSAs from OGAs must be properly certified by their Cognizant Security Official.
  - (d) Approved SSA's will be authorized for three years or for the length of the contract, whichever is less.
  - (e) The Designated Responsible Office (DRO) will be responsible for renewal submissions. Sigma authorizations must be immediately removed from SSIMS for SSAs that do not have renewals submitted 30-days prior to expiration.

f. Electronic Transmission.

- (1) Non-Sigma NWD may be sent electronically only over approved classified networks if need-to-know for that information is assured. .
  - (a) Non-Sigma Secret/RD NWD may be sent to the DoD and OGAs on SIPRNET without secondary encryption.
  - (b) Non-Sigma Secret/RD NWD may be sent via ESN.

- (2) Secure Telecommunication Transmission of Non-Sigma NWD using point-to-point secure communication via appropriately certified secure telecommunication systems is permitted at both Secret and Top Secret levels, provided they are consistent with approved site security plans. Access authorization and need-to-know must be verified prior to transmission.
6. **MARKING**. The following marking requirements apply to documents and hardware containing NWD.
  - a. All newly created NWD or existing NWD that has been modified, updated or corrected must be reviewed for Sigma content and appropriately marked.
  - b. Unmodified Sigma NWD with obsolete Sigma markings does not require review or remarking when accessed. Classified matter must be reviewed and brought up to current marking standards whenever it is released outside of the DOE/NNSA Q-cleared population within the NSE, outside of the NSE, to DoD or OGAs.
  - c. **Documents**.
    - (1) Non-Sigma NWD does not require additional marking beyond what is required for Restricted Data. For example:

**RESTRICTED DATA**

This document contains Restricted Data as defined in the Atomic Energy Act of 1954. Unauthorized disclosure is subject to Administrative and Criminal Sanctions.
    - (2) Historical documents must be reviewed and properly marked prior to transmission outside of the DOE/NNSA Q-cleared population within the NSE, to DoD or OGAs. When possible, the site technical information offices or equivalent and OSTI will be notified of the marking change.
7. **STORAGE REQUIREMENTS**. Storage of Non-Sigma NWD will be consistent with National Standards for protection of classified information.
8. **ACCOUNTABILITY**. Top Secret Non-Sigma NWD is accountable.
9. **DESTRUCTION**. NWD holdings must be kept to a minimum. Multiple copies, obsolete matter and classified waste must be destroyed as soon as practical. Classified matter must be destroyed in accordance with records disposition schedules, including the National Archives Records Administration General Records Schedules, DOE records schedule and as outlined in DOE M 470.4-4A or NAP 70.4.
10. **INFORMATION TECHNOLOGY SYSTEMS**. Non-Sigma NWD residing on computer systems does not require additional protection beyond what is required for Restricted



Data. Specific baseline requirements contained in DOE M 205.1-4, *National Security System*, dated 3-8-07, (or its successor) must be followed.

**APPENDIX B  
 PROTECTION OF COMPLETE DESIGNS**

1. IDENTIFICATION OF SIGMA 18 NUCLEAR WEAPON DATA (NWD).
  - a. Sigma 18 Complete Design information would allow or significantly facilitate a proliferant nation or state to fabricate a credible nuclear weapon or nuclear explosive based on a proven, certified, or endorsed U.S. nuclear weapon or device. The information would enable the establishment or improvement of nuclear capability without nuclear testing or with minimal research and development.
  - b. Newly created NWD or existing NWD that has been modified, updated or corrected must be reviewed. If the NWD is determined to contain Sigma 18, it must be appropriately marked.

2. ACCESS REQUIREMENTS.

- a. See Table B-1 below for clearance and access requirements for Sigma 18. In addition to the clearance requirements, access to Sigma 18 must be restricted to personnel with a valid need-to-know.

**TABLE B-1: Sigma 18 Access Requirements**

	DOE L Clearance	DOE Q Clearance	DoD/OGA Final Top Secret	DoD Final Secret & CNWDI Brief	DoD/OGA Final Secret
Sigma 18 (TS-RD/FRD; S- RD/FRD)	No	Yes	Yes*	No	No

Table Key:

- Yes – An individual with one of the clearances in the top row may have access to the category of classified information listed in the left column.
- Yes\* - An individual with one of the clearances in the top row may have access to the category of classified information listed in the left column with the additional requirement of formal access approval.
- No – An individual with one of the clearances in the top row may not have access to the category of classified information listed in the left column.

- b. The NNSA NWD Program Coordinator will provide guidance on the appropriate background investigation required for each clearance.

3. ACCESS REQUESTS.

- a. Requests for access to Sigma 18 NWD by non-NSE, DoD and OGA personnel must be made using DOE F 5631.20, *U.S. Department of Energy Request for Visit*

*or Access Approval.* The visit request must be submitted at least 15 working days before the date of a one-time visit or the first day of a recurring visit. Exceptions to the 15 working day requirement can be found in DOE M 470.4-1, Chg. 1, *Safeguards and Security Program Planning and Management*, dated 8-26-05.

- (1) The National Aeronautics and Space Administration (NASA) may submit Sigma 18 requests on NASA Form 405, *Request for Access Approval*.
  - (2) The Nuclear Regulatory Commission (NRC) may submit Sigma 18 requests on NRC Form 277, *Request for Access*.
- b. Non-NSE authorizations for access to Sigma 18 NWD may not exceed one year, although reauthorization is allowed.
  - c. Non-NSE contractor authorizations will expire after one year or on the final day of the contract, whichever is less.
  - d. Authorization for Q-cleared personnel within the Nuclear Security Enterprise (NSE) to access Sigma 18 NWD is presumed with their association to the NSE, need-to-know still applies. Within the NSE, Sigma 18 is not a managed program. NNSA HQ manages access to Sigma 18 for Non-NSE, DoD and OGA personnel.

#### 4. ORAL/VISUAL COMMUNICATION.

- a. Oral/visual communication of Sigma 18 information (for example, discussions or presentations) must be restricted to those persons with appropriate Sigma access authorization, valid need-to-know, and DOE "Q" clearance or the equivalent based on the appropriate current background investigation. The NNSA NWD Program Coordinator will provide guidance on the appropriate background investigation.
- b. Distribution of Sigma 18 NWD presentations within DOE (including NNSA and other locations) will be restricted to authorized individuals as prescribed in Table 2 above.

#### 5. RECEIVING AND TRANSMITTING.

- a. Distribution of Sigma 18 NWD within DOE (including NNSA and other locations) will be restricted to individuals with appropriate Sigma 18 access authorization, valid need-to-know, and DOE "Q" clearance or the equivalent, based on the appropriate current background investigation. The NNSA NWD Program Coordinator will provide guidance on appropriate background investigation.
- b. Prior to distribution outside the NSE "Q" cleared population, to DoD or OGAs, NWD must be reviewed for Sigma 18 content and brought up to current marking standards.

- c. Before transmitting Sigma 18 information to the DoD or OGAs, the recipient's access must be validated by the NNSA NWD Program Coordinator.
- d. Matter (for example, documents, hardware or electronic media).
  - (1) Secret/RD Sigma 18 NWD may be hand-carried, sent via the U.S. Postal Service Registered Mail system or overnight service when it is critical that it be there the next day. Procedures for use of overnight services as outlined in DOE M 470.4-4A, *Information Security Manual*, dated 1-16-09 or NNSA Policy Letter (NAP) 70.4 *Information Security*, dated 7-2-10 must be followed. Top Secret RD Sigma 18 NWD must be sent via the Defense Courier Service, the Department of State Courier System, or hand-carried.
  - (2) A Statement of Security Assurance (SSA) (formerly known as mail channel) must be established for receipt and storage of Sigma 18 matter for all DoD, OGAs and OGA contractor facilities. It is the sender's responsibility to contact their Safeguards and Security Information Management System (SSIMS) Coordinator to ensure that one is initiated or already in place prior to sending the material. The SSIMS Coordinator will confirm the site is authorized to receive Sigma 18 matter through SSIMS. If a SSA is not in place, one must be initiated and processed using the procedures outlined in DOE M 470.4-1, Chg. 1.
    - (a) A detailed unclassified justification must be provided justifying the facility's need to receive and store Sigma 18 NWD for those SSA's not based on a contract.
    - (b) Each SSA must be submitted to the Office of Nuclear Weapon Surety and Quality 30-days prior to the required establishment date.
    - (c) Each SSA must be properly certified.
      - 1 DoD SSAs must be properly certified by an authorized official from the most recent Enclosure 5 of the DoD Directive 5210.2. A copy can be obtained directly from the Office of the Deputy Assistant to the Secretary of Defense (Nuclear Matters).
      - 2 SSAs from OGAs must be properly certified by their Cognizant Security Official.
    - (d) Approved SSA's will be authorized for three years or for the length of the contract, whichever is less.

- (e) The Designated Responsible Office (DRO) will be responsible for renewal submissions. Sigma 18 authorizations must be immediately removed from SSIMS for SSAs that do not have renewals submitted 30-days prior to expiration.
- e. Electronic Transmission.
  - (1) Secret/RD Sigma 18 NWD may be sent via the Enterprise Secure Network (ESN). Need-to-know must be verified prior to transmission. Top Secret information is prohibited from being sent intra-site or inter-site via ESN. The use of SIPRNET for transmission of SRD Sigma 18 is prohibited.
  - (2) Secure Telecommunication Transmission of Sigma 18 NWD using point-to-point secure messages via appropriately certified secure telecommunication systems is permitted at both Secret and Top Secret levels, provided they are consistent with approved site security plans. Access authorization and need-to-know must be verified prior to transmission.
- 6. MARKING. The following marking requirements apply to all documents and hardware containing Sigma 18 NWD.
  - a. All newly created NWD or existing NWD that has been modified, updated or corrected must be reviewed for Sigma 18 content and appropriately marked.
  - b. Unmodified Sigma NWD with obsolete Sigma markings does not require review or remarking when accessed. Classified matter must be reviewed for Sigma 18 content and brought up to current marking standards whenever it is released outside of the DOE/NNSA Q cleared population within the NSE, outside of the NSE, to DoD or OGAs.
  - c. Documents.
    - (1) Sigma marking (for example, Sigma 18) must be placed above the admonishment box on the first page (whether cover page, title page, or the first page of text). For example:

Sigma 18

<p><b>RESTRICTED DATA</b></p> <p>This document contains Restricted Data as defined in the Atomic Energy Act of 1954. Unauthorized disclosure is subject to Administrative and Criminal Sanctions.</p>
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- (2) Documents containing Sigma 18 NWD must be marked with Sigma 18 NWD category as prescribed in DOE M 470.4-4A or NNSA NAP 70.4.

- (3) Individual pages of a Sigma 18 NWD document may be marked with the words Sigma 18 as appropriate. All NWD categories are required to be marked per DOE M 470.4-4A or NNSA NAP 70.4.
  - (4) Historical documents must be reviewed and properly marked prior to transmission outside of the DOE/NNSA Q cleared population within the NSE, to DoD or OGAs. When possible, the site technical information offices or equivalent and OSTI will be notified of the marking change.
  - (5) Sigma 18 documents may have locally produced cover sheets specifying that appropriate Sigma 18 access is required before viewing the contents.
    - (a) When a Sigma 18 document is removed from a security container, a standard form cover sheet must be applied to each document by placing it over the locally produced Sigma 18 cover sheet.
    - (b) In lieu of the two cover sheets, a locally produced cover sheet or identifying label on a standard form cover sheet may be used if approved by the responsible security office.
7. STORAGE REQUIREMENTS. Storage of Sigma 18 NWD will be consistent with National Standards for protection of classified information.
8. ACCOUNTABILITY. Top Secret Sigma 18 matter is accountable.
9. DESTRUCTION. Sigma 18 matter must be kept to a minimum. Multiple copies, obsolete matter and classified waste must be destroyed as soon as practical. Classified matter must be destroyed in accordance with records disposition schedules, including the National Archives Records Administration General Records Schedules, and DOE records schedule.
10. INFORMATION TECHNOLOGY (IT) SYSTEMS.
  - a. Sigma 18 data residing on computer systems will be protected from unauthorized access, in a manner equivalent to the controls in place for the protection of Sigma 18 matter. Sigma 18 information on IT systems must be protected while in storage, use, and transmission from unauthorized disclosure to persons without valid need-to-know and DOE “Q” clearance or the equivalent.
  - b. Specific baseline requirements contained in DOE M 205.1-4, *National Security System*, dated 3-8-07, (or its successor) must be followed for Sigma 18 NWD.

## APPENDIX C OBSOLETE NWD CATEGORIES

1. This Order disestablishes NWD categories that have been used for many years and may remain marked on legacy matter. The following policies and procedures apply to the review and marking of legacy matter.
  - a. Unmodified Sigma NWD with obsolete Sigma markings does not require review or remarking when accessed. Classified matter must be reviewed and brought up to current marking standards whenever it is released outside of the NSE Q cleared population, to DoD or OGAs.
  - b. When required, basic marking requirements found in DOE M 470.4-4A, *Information Security Manual*, dated 1-16-09, *Information Security Manual*, dated 1-16-09 or NNSA Policy Letter (NAP) 70.4 *Information Security*, dated 7-2-10, must be followed.
  
2. The following NWD categories are obsolete:
  - a. Sigma 1. An obsolete category of NWD that previously contained information relating to the theory of operation (hydrodynamic and nuclear) or complete design of thermonuclear weapons or their unique components.
  - b. Sigma 2. An obsolete category of NWD that previously contained information relating to the theory of operation or complete design of fission weapons or their unique components. It included the high explosive system with its detonators and firing unit, pit system, and nuclear initiation system as it pertained to weapon design theory.
  - c. Sigma 3. An obsolete category of NWD that previously contained manufacturing and utilization information not comprehensively revealing the theory of operation or design of the physics package. It included complete design and operation of nonnuclear components but only information as prescribed below for nuclear components and utilization information necessary to support the stockpile to target sequence. Information previously included:
    - (1) General external weapon configuration, including size, weight, and shape.
    - (2) Environmental behavior, fuzing, ballistics, yields, and effects.
    - (3) Nuclear components or subassemblies which do not reveal theory of operation or significant design features.
    - (4) Production and manufacturing techniques relating to nuclear components or subassemblies.
    - (5) Anticipated and actual strike operations.

- d. Sigma 4. An obsolete category of NWD that previously contained information inherent in pre-shot and post-shot activities necessary in the testing of atomic weapons or devices. Specifically excluded were the theory of operation and the design of such items. Information previously included:
  - (1) Logistics, administration, other agency participation.
  - (2) Special construction and equipment.
  - (3) Effects, safety.
  - (4) Purpose of tests, general nature of nuclear explosive tested including expected or actual yields and conclusions derived from tests not to include design features.
- e. Sigma 5. An obsolete category of NWD that previously contained production rate and/or stockpile quantities of nuclear weapons and their components.
- f. Sigma 9. An obsolete category of NWD the previously included general studies not directly related to the design or performance of specific weapons or weapon systems, e.g., reliability studies, fuzing studies, damage studies, aerodynamic studies, etc.
- g. Sigma 10. An obsolete category of NWD the previously included information relating to the chemistry, metallurgy, and processing of materials peculiar to the field of atomic weapons or nuclear explosive devices.
- h. Sigma 11. An obsolete category of NWD that previously included information concerning initial confinement fusion which reveals or is indicative of weapon data.
- i. Sigma 12. An obsolete category of NWD that previously contained complete theory of operation, complete design, or partial design information revealing either sensitive design features or how the energy conversion takes place for the nuclear energy converter, energy director or other nuclear directed energy weapon systems or components outside the envelope of the nuclear source but within the envelope of the nuclear directed energy weapon.
- j. Sigma 13. An obsolete category of NWD that previously included manufacturing and utilization information and output characteristics for nuclear energy converters, directors or other nuclear directed energy weapon systems or components outside the envelope of the nuclear source, not comprehensively revealing the theory of operation, sensitive design features of the nuclear directed energy weapon or how the energy conversation takes place. Information previously included:
  - (1) General, external weapon configuration and weapon environmental behavior characteristics, yields, and effects.



- (2) Components or subassembly design that does not reveal theory of operation or sensitive design features of nuclear directed energy weapons.
- (3) Production and manufacturing techniques for components or subassemblies of nuclear directed energy weapons.

**CONTRACTOR REQUIREMENTS DOCUMENT**  
**DOE O 452.Z, CONTROL OF NUCLEAR WEAPON DATA**

This Contractor Requirements Document (CRD) specifies requirements applicable to Department of Energy (DOE) contractors, including National Nuclear Security Administration (NNSA) contractors, whose employees have access to nuclear weapon data (NWD).

Regardless of the performer of the work, the contractor is responsible for compliance with the requirements of this CRD. Affected site/facility management contractors are responsible for flowing down the requirements of this CRD to subcontractors at any tier to the extent necessary to ensure compliance with the requirements.

A violation of the provisions of the CRD relating to the safeguarding or security of Restricted Data or other classified information may result in a civil penalty pursuant to subsection a. of section 234A of the Atomic Energy Act of 1954 (42 U.S.C. 2282b). The procedures for the assessment of civil penalties are set forth in Title 10, *Code of Federal Regulations* (CFR), Part 824, "Procedural Rules for the Assessment of Civil Penalties for Classified Information Security Violations."

All contractors with this CRD incorporated in their contracts must comply with the following requirements.

1. IDENTIFICATION OF NUCLEAR WEAPON DATA (NWD).
  - a. All Restricted Data or Formerly Restricted Data containing design, manufacture, or use (including theory, development, storage, characteristics, performance, and effects) of nuclear weapons or nuclear weapon components, including information incorporated in or related to nuclear explosive devices is considered NWD.
  - b. NWD may be categorized as Sigma 14, Sigma 15, Sigma 18 and/or Sigma 20.
    - (1) Specific details on the management of Sigma 14 and Sigma 15 NWD is found in the CRD to DOE O 452.7, *Protection of Use Control Vulnerabilities and Designs* dated 5-14-10.
    - (2) Specific details on the management of Sigma 18 NWD is found in this CRD.
    - (3) Specific details on the management of Sigma 20 NWD is found in the CRDs to DOE O 457.1, *Nuclear Counterterrorism*, dated 2-7-06 and DOE M 457.1-1, *Control of Improvised Nuclear Device Information*, dated 8-10-06.
  - c. Not all NWD requires the additional protection of a Sigma category. NWD that is not in a Sigma category is referred to as Non-Sigma NWD. Details for the protection of Non-Sigma NWD are contained in this CRD.

- d. Newly created NWD or existing NWD that has been modified, updated or corrected must be reviewed. If the NWD is determined to contain Sigma 14, Sigma 15, Sigma 18 or Sigma 20, it must be appropriately marked.
  - e. Unmodified legacy NWD with obsolete Sigma markings do not require review or remarking when accessed.
2. GENERAL REQUIREMENTS. Only individuals who have appropriate clearance and valid need-to-know are permitted access to NWD.
- a. Authorization for personnel to access any NWD category will only be granted to individuals, not to organizations, functional groups, or position assignments (for example, access is not granted to all members of “XYZ Division” or to all “engineers”).
  - b. Authorization for DOE personnel to access Sigma 14, Sigma 15, Sigma 18 and/or Sigma 20, will be granted in accordance with requirements of this CRD.
    - (1) Specific requirements for access to Sigma 14 and Sigma 15 can be found in the CRD to DOE O 452.7.
    - (2) Specific details on the management of Sigma 18 NWD is found in this CRD.
    - (3) Specific requirements for access to Sigma 20 can be found in the CRDs to DOE O 457.1 and DOE M 457.1-1.
  - c. Authorization for non-NSE and OGA personnel to access Sigma NWD will be granted at NNSA Headquarters. Only visits to NSE sites will be documented in WDACS.
  - d. Visits by NSE personnel to sites within the NSE will not be documented in WDACS.
  - e. Coordinate with OSTI to provide appropriate life cycle management of scientific and technical NWD produced under their jurisdiction in accordance with the requirements found in the CRD to DOE O 241.1A.
  - f. The site technical information offices (or equivalent) and OSTI will be notified of the marking changes to historical documents.
3. RESPONSIBILITIES OF COGNIZANT SECURITY AUTHORITY.
- a. Confirm that site employees and contractors who have been granted access to NWD including Sigma 14, Sigma 15, Sigma 18 and/or Sigma 20 have:
    - (1) appropriate security clearance and

- (2) valid need-to-know for the NWD and each NWD category they have been granted access.
  - b. Ensure that employees and contractors under their jurisdiction follow the requirements of this CRD.
  - c. Ensure that NWD planned for transmittal is reviewed for classification content and prescribed markings. Prior to transmittal, verify that the recipient has:
    - (1) appropriate security clearance,
    - (2) valid need-to-know,
    - (3) access authorization for the appropriate NWD category,
    - (4) appropriate facility clearance, storage capability and authorization recorded in the SSIMS and
    - (5) contact the NNSA NWD Program Coordinator to verify the clearance of DoD or OGA recipients.
  - d. Assure the disposition of weapon data documents on the completion of work requiring access to NWD or termination of a contract.
4. ACCESS REQUIREMENTS.
- a. See Table 1-1 below for clearance and access requirements. In addition to the clearance requirements, access to NWD must be restricted to personnel with a valid need-to know.

**TABLE 1-1: CRD Clearance and Access Requirements**

	DOE L Clearance	DOE Q Clearance	DoD/OGA Final Top Secret	DoD Final Secret & CNWDI Brief	DoD/OGA Final Secret
Non-Sigma (S-FRD;C-RD/FRD)	Yes	Yes	Yes	Yes	Yes
Non-Sigma (S-RD)	No	Yes	Yes	Yes	No
CNWDI (S-RD)	No	Yes	Yes	Yes	No
Non-Sigma (TS-RD/FRD)	No	Yes	Yes	No	No

	DOE L Clearance	DOE Q Clearance	DoD/OGA Final Top Secret	DoD Final Secret & CNWDI Brief	DoD/OGA Final Secret
Sigma 14 (TS-RD/FRD; S-RD/FRD)	No	Yes*	Yes*	No	No
Sigma 15 (TS-RD/FRD; S-RD/FRD)	No	Yes*	Yes*	No	No
Sigma 18 (TS-RD/FRD; S-RD/FRD)	No	Yes	Yes*	No	No
Sigma 20 (TS-RD;S-RD)	No	Yes*	Yes*	No	No

Table Key:

Yes – An individual with one of the clearances in the top row may have access to the category of classified information listed in the left column.

Yes\* - An individual with one of the clearances in the top row may have access to the category of classified information listed in the left column with the additional requirement of formal access approval.

No – An individual with one of the clearances in the top row may not have access to the category of classified information listed in the left column.

- b. The NNSA NWD Program Coordinator will provide guidance on the appropriate background investigation required for each clearance.

5. ACCESS REQUESTS.

- a. Requests for access to Sigma 18 NWD by non-NSE personnel will be processed by the Office of Nuclear Weapon Surety and Quality using DOE F 5631.20, *U.S. Department of Energy Request for Visit or Access Approval*. The visit request must be submitted at least 15 working days before the date of a one-time visit or the first day of a recurring visit. Details of the requirements can be found in the CRD to DOE M 470.4-1, Chg. 1, *Safeguards and Security Program Planning and Management*, dated 8-26-05.
- b. Authorization for Q-cleared personnel within the NSE to access Sigma 18 NWD is presumed with their association to the NSE, need-to-know still applies. Within the NSE, Sigma 18 is not a managed program. NNSA HQ manages access to Sigma 18 for Non-NSE, DoD and OGA personnel.

- c. Requests for access to Sigma 18 from DoD and OGAs can only be granted by the NNSA Office of Nuclear Weapon Surety and Quality.
  - (1) Requests for access to Sigma 18 must be made using DOE F 5631.20, *U.S. Department of Energy Request for Visit or Access Approval*.
  - (2) The visit request must be submitted at least 15 working days before the date of a one-time visit or the first day of a recurring visit. Exceptions to the 15 working day requirement can be found in the CRD to DOE M 470.4-1.
  - (3) Approval will be provided for specific purposes or projects and will be contingent upon confirmation that the personnel have DOE “Q” clearance or equivalent, based on the appropriate, current background investigation and valid need-to-know. The NNSA NWD Program Coordinator will provide guidance on the appropriate background investigation.
  - (4) The National Aeronautics and Space Administration (NASA) may submit Sigma 18 requests on NASA Form 405, *Request for Access Approval*.
  - (5) The Nuclear Regulatory Commission (NRC) may submit Sigma 18 request on NRC Form 277, *Request for Access*.
  - (6) Non-NSE authorizations for access to Sigma 18 NWD may not exceed one year, although reauthorization is allowed.
  - (7) Non-NSE contractor authorizations will expire after one year or on the final day of the contract, whichever is less.

6. ORAL/VISUAL COMMUNICATION.

- a. Oral/visual communication (for example, discussions or presentations) must be restricted to those persons with appropriate NWD clearance and valid need-to-know.
- b. Oral/visual communication of Sigma 18 information (for example, discussions or presentations) must be restricted to those persons with appropriate Sigma access authorization, valid need-to-know, and DOE “Q” clearance or the equivalent based on the appropriate current background investigation. The NNSA NWD Program Coordinator will provide guidance on the appropriate background investigation.
- c. Distribution of Sigma 18 NWD presentations within DOE (including NNSA and other locations) will be restricted to authorized individuals as prescribed in Table 3 above.
- d. Sites having a classified nuclear weapon display area (WDA) will grant and control access to the WDA using procedures established at each location and

controlled in a manner consistent with the classification and NWD category of the information revealed. Access to WDAs will not be entered or tracked in WDACS.

7. RECEIVING AND TRANSMITTING. The receipt and transmission requirements found in the CRD to DOE M 470.4-4A, *Information Security Manual*, dated 1-16-09 or NNSA Policy Letter (NAP) 70.4 *Information Security*, dated 7-2-10 (or successors), must be followed for NWD. Additionally, only personnel that have appropriate Sigma access authorizations may be designated as agents for addressees.
  - a. Distribution of NWD within DOE (including NNSA and other locations) will be restricted to individuals with appropriate clearance and valid need-to-know.
  - b. Distribution of Sigma 18 NWD within DOE (including NNSA and other locations) will be restricted to individuals with appropriate Sigma 18 access authorization, valid need-to-know, and DOE "Q" clearance or the equivalent, based on the appropriate current background investigation. The NNSA NWD Program Coordinator will provide guidance on appropriate background investigation.
  - c. Prior to distribution within the NSE, unmodified legacy NWD requires a review for Sigma 14, Sigma 15, Sigma 18 and Sigma 20 and brought up to current marking standards.
  - d. Prior to distribution outside the NSE "Q" cleared population, to DoD or OGAs, NWD must be reviewed for Sigma content and brought up to current marking standards.
  - e. Before transmitting Sigma information to the DoD or OGAs, the recipient's access must be validated by the Office of Nuclear Weapon Surety and Quality.

**Note:** Sigma 14 and Sigma 20 NWD have additional requirements prior to transmission.
  - f. Matter (for example, documents, hardware or electronic media).
    - (1) Non-Sigma NWD will be handled and transmitted using the procedures outlined in the CRD to DOE M 470.4-4A or NNSA NAP 70.4 (or successor directives).
    - (2) Secret/RD Sigma 18 NWD may be hand-carried, sent via the U.S. Postal Service Registered Mail system or overnight service when it is critical that it be there the next day. Procedures for use of overnight services as outlined in the CRD to DOE M 470.4-4A or NNSA NAP 70.4, must be followed. Top Secret RD Sigma 18 NWD must be sent via the Defense Courier Service, the Department of State Courier System, or hand-carried.
    - (3) A Sigma 18 Statement of Security Assurance (SSA) (formerly known as mail channel) must be established for receipt and storage of Sigma 18

matter for all DoD, OGAs and OGA contractor facilities. It is the sender's responsibility to contact their Safeguards and Security Information Management System (SSIMS) Coordinator to ensure that one is initiated or already in place prior to sending the material. The SSIMS Coordinator will confirm the site is authorized to receive Sigma 18 matter through SSIMS. If an SSA is not in place, one must be initiated and processed using the procedures outlined in the CRD to DOE M 470.4-1 Chg 1.

- (a) A detailed unclassified justification must be provided justifying the facility's need to receive and store nuclear weapon data for those SSAs not based on a contract.
- (b) Each SSA must be submitted to the Office of Nuclear Weapon Surety and Quality 30-days prior to the required establishment date.
- (c) Each SSA must be properly certified.
  - 1 DoD SSAs must be properly certified by an authorized official from the most recent Enclosure 5 of the DoD Directive 5210.2. A copy can be obtained directly from the Office of the Deputy Assistant to the Secretary of Defense (Nuclear Matters).
  - 2 SSAs from OGAs must be properly certified by their Cognizant Security Official.
- (d) Approved SSA's will be authorized for three years or for the length of the contract, whichever is less.
- (e) The Designated Responsible Office (DRO) will be responsible for renewal submissions. Sigma authorizations must be immediately removed from SSIMS for SSAs that do not have renewals submitted 30-days prior to expiration.

g. Electronic Transmission.

- (1) Non-Sigma NWD may be sent electronically only over approved classified networks if need-to-know for that information is assured.
  - (a) Non-Sigma Secret/RD NWD may be sent to the DoD and OGAs on SIPRNET without secondary encryption.
  - (b) Non-Sigma Secret/RD NWD may be sent via ESN.
- (2) Secret/RD Sigma 18 NWD may be sent via the Enterprise Secure Network (ESN). Need-to-know must be verified prior to transmission. Top Secret



information is prohibited from being sent intra-site or inter-site via ESN. The use of SIPRNET for transmission of SRD Sigma 18 is prohibited.

- (3) Secure Telecommunication Transmission of Non- Sigma and Sigma 18 NWD using point-to-point secure messages via appropriately certified secure telecommunication systems is permitted at both Secret and Top Secret levels, provided they are consistent with approved site security plans. Access authorization and need-to-know must be verified prior to transmission.

8. MARKING. The following marking requirements apply to all documents and hardware containing Sigma 18 NWD.

- a. All newly created NWD or existing NWD that has been modified, updated or corrected must be reviewed for Sigma 14, Sigma 15, Sigma 18 and/or Sigma 20 content and appropriately marked.
- b. Unmodified legacy NWD with obsolete Sigma markings does not require review or remarking when accessed. Classified matter must be reviewed for Sigma 14, Sigma 15, Sigma 18 and Sigma 20 content prior to transmission and brought up to current marking standards whenever it is released outside of the DOE/NNSA Q cleared population within the NSE, outside of the NSE, to DoD or OGAs.
- c. Documents. When required, basic marking requirements found in the CRD to DOE M 470.4-4A or NNSA NAP 70.4 must be followed for Sigma 18 NWD, with the following additions.
  - (1) Sigma marking (for example: Sigma 18) must be placed above the admonishment box on the first page (whether cover page, title page, or the first page of text). For example:

Sigma 18

**RESTRICTED DATA**

This document contains Restricted Data as defined in the Atomic Energy Act of 1954. Unauthorized disclosure is subject to Administrative and Criminal Sanctions.

- (2) Documents containing Sigma 18 NWD must be marked with the NWD category as prescribed in the CRD to DOE M 470.4-4A or NNSA NAP 70.4.
- (3) Individual pages of a Sigma 18 NWD document may be marked with the words Sigma 18 as appropriate. All NWD categories are required to be marked per the CRD to DOE M 470.4-4A or NNSA NAP 70.4.

- (4) Sigma 18 documents may have locally produced cover sheets specifying that appropriate Sigma 18 access is required before viewing the contents.
    - (a) When a Sigma 18 document is removed from a security container, a standard form cover sheet must be applied to each document by placing it over the locally produced Sigma 18 cover sheet.
    - (b) In lieu of the two cover sheets, a locally produced cover sheet or identifying label on a standard form cover sheet may be used if approved by the responsible security office.
9. IN USE. The in-use requirements found in the CRD to DOE M 470.4-4A or NNSA NAP 70.4 must be followed for Sigma 18 NWD.
10. STORAGE REQUIREMENTS. Storage of Sigma 18 NWD will be consistent with National Standards for protection of classified information.
11. ACCOUNTABILITY. Top Secret Non-Sigma and Sigma 18 matter is accountable.
12. DESTRUCTION. Non-Sigma and Sigma 18 matter must be kept to a minimum. Multiple copies, obsolete matter, and classified waste must be destroyed as soon as practical. Classified matter must be destroyed in accordance with records disposition schedules, including the National Archives Records Administration General Records Schedules, and DOE records schedule. For more detail on destruction, see requirements found in the CRD to DOE M 470.4-4A or NNSA NAP 70.4.
13. INFORMATION TECHNOLOGY (IT) SYSTEMS.
  - a. Sigma 18 data residing on computer systems will be protected from unauthorized access, in a manner equivalent to the controls in place for the protection of Sigma 18 matter. Sigma 18 information on IT systems must be protected while in storage, use and transmission from unauthorized disclosure to persons without a valid need-to-know and DOE "Q" clearance or the equivalent. Encryption of Sigma 18 at rest is not required.
  - b. Specific baseline requirements contained in the CRD to DOE M 205.1-4, *National Security System*, dated 3-8-07, (or its successor) must be followed for Sigma 18 NWD.